

CLAIMS

I Claim:

1. A semiconductor package comprising:

a metal slug having upper and lower surfaces;

an integrated circuit die, mounted on the metal slug, the integrated circuit die having signal pads and ground pads;

a lead frame having a plurality of leads; and

a semiconductor package body, wherein signal pads on the integrated circuit die are coupled to leads on the lead frame, ground pads on the integrated circuit are coupled to the upper surface of the metal slug and the lower surface of the metal slug remains exposed and extends a predefined distance outside the semiconductor package.

2. The semiconductor package of claim 1 wherein the predefined distance at least equals the thickness of a printed circuit board upon which the semiconductor package is mounted, the metal slug extending through a cutout in the printed circuit board and being coupled to at least a first ground plane in the printed circuit board.

3. The semiconductor package of claim 2 wherein the lower surface of the metal slug is electrically coupled to a ground plane exposed on a bottom surface of a printed circuit board.

4. The semiconductor package of claim 2 wherein the lower surface of the metal slug is electrically coupled to a ground pad on a top surface of a printed circuit board, the

ground pad further being electrically coupled to a ground plane within the printed circuit board by plated-through vias.

5 5. The semiconductor package of claim 2 wherein a heat sink is attached to the lower surface of the metal slug after it has been extended through the cutout in the printed circuit board.

10 6. An integrated circuit package with a metal slug, the metal slug comprising:
an upper surface upon which a semiconductor die is mounted and to which ground pads on the semiconductor die are electrically coupled; and

a lower surface extending at least until it is exposed and co-planar with an exterior surface of the integrated circuit package.

15 7. The integrated circuit package of claim 6 wherein the metal slug is extended so that it can be inserted through a predefined cutout in a printed circuit board upon which the integrated circuit package is mounted, the lower surface of the metal slug being exposed after the integrated circuit package has been inserted into the cutout.

20 8. The integrated circuit package of claim 7 wherein the lower surface of the metal slug is electrically coupled to a ground plane on a top surface of a printed circuit board, upon which printed circuit board the integrated circuit package is mounted.

25 9. The integrated circuit package of claim 7 wherein the lower surface of the metal slug is electrically coupled to a ground plane within a printed circuit board by means of vias through the printed circuit board and a surface ground pad on a top surface of

the printed circuit board, the vias coupling the ground plane to the surface ground pad and the lower surface being electrically coupled to the surface ground pad.

10. The integrated circuit package of claim 7 wherein a heat sink is attached to the exposed lower surface of the metal slug after it has been extended through the printed circuit board.

11. A method for creating a reduced inductance path with increased heat sinking between an integrated circuit die and a ground plane in a printed circuit board, the method comprising the steps of:

mounting the integrated circuit die on a metal slug;

electrically coupling ground pads on the integrated circuit die to a top surface of the metal slug;

forming a body around the integrated circuit die and the metal slug, a lower surface of the metal slug remaining at least exposed after the body has been formed; and

electrically coupling the exposed lower surface of the metal slug to the ground plane of the printed circuit board.